

What is claimed is:

1. An on-demand printing supporting system for outputting printing information to an output device capable of printing the printing information on a printing medium desired by a user, said system comprising:

a printing information recording means for enabling the user to input, via a computer network, the printing information in a predetermined data form, and to record the printing information in a printing information database;

a printing information retrieving means for notifying a handler that the printing information has been received, and for enabling the handler to retrieve the printing information;

an edited printing information recording means for enabling the handler to input and record an edited printing information in an edited printing information database; and

an output means for outputting the edited printing information to a printing device capable of printing the edited printing information on the printing medium desired by the user.

2. The on-demand printing supporting system claimed in claim 1, further comprising:

a request for a cost estimate notifying means for notifying the handler that a request for a cost estimate has been made by the user; and

a final cost estimate notifying means for enabling the handler to input and send a final cost estimate to the user;

wherein said printing information recording means enables the user who received the final cost estimate to input said printing information, and records the printing information in the printing

information database.

3. The on-demand printing supporting system claimed in claim 2, wherein said final cost estimate notifying means notifies the user of the final cost estimate and the ID code which enables the user to connect the user's terminal to said printing information recording means.

4. The on-demand printing supporting system claimed in claims 1 or 3, further comprising a controlled printing information recording means for enabling the handler to input and record in a controlled printing information database a controlled information of the edited printing information; wherein the controlled printing information recording means controls the edited printing information recorded in the edited printing information database by the edited printing information recording means.

5. The on-demand printing supporting system claimed in claims 1 or 4, wherein said output means comprises a selecting means for selecting an output device from among a plural number of output devices connected to the computer network, and for outputting the edited printing information to the selected output device.

6. An on-demand printing supporting system for outputting printing information to an output device capable of printing the printing information on a printing medium desired by a user, and for delivering the printed products to the user, wherein the printing information is recorded on the

printing medium desired by the user by enabling the user to input to the output device the printing information via the on-demand printing supporting system claimed in claim 1 or 4.

7. An on-demand printing supporting system for outputting printing information to an output device capable of printing the printing information on a printing medium desired by a user, and for delivering the printed products to the user, wherein the printing information is recorded on the printing medium desired by the user by enabling the user to select an output device capable of recording the printing information on the printing medium desired by the user via the on-demand printing supporting system claimed in claim 5.

8. An on-demand printing supporting system for outputting a printing information inputted by a user to an output device capable of recording the printing information on a printing medium desired by the user, said system comprising the steps of:

enabling the user to input the printing information and recording the printing information in a printing information database;

notifying a handler that the printing information has been received and enabling the handler to retrieve the printing information;

enabling the handler to input an edited printing information and to record the edited printing information in an edited printing information database; and

outputting the edited printing information to the output device capable of recording the edited printing information on the printing medium desired by the user.

[0001]

Technical area of this invention

This invention relates to an on-demand printing supporting device and method and an on-demand printing service system, which outputs printing information to an output device capable of recording the printing information on a printing medium desired by the user.

[0002]

Conventional technology

In the conventional off-set printing workflow, the user makes a draft copy of the printed product and orders the printing company to produce a printed product based on the draft copy made by the user. The printing company, once received the order, makes a draft copy for their own use based on the draft copy provided by the user, makes corrections on the draft copy several times, prints out the finalized draft copy, processes the printed product if necessary, such as binding the printed papers, and then deliver the finished printed product to the user.

[0003]

The problems to be solved by this invention

In the aforesaid workflow however, draft copy material of a printed produce is prepared by both a printing company and a user and therefore, an unnecessary process is included which possibly results in both time loss and financial loss during the printing process. Also, if the draft copy material provided by a user is actually used for printing, there is a possibility that deterioration in

quality may occur during the printing process. Since it causes time loss and/or an increase in shipping expenses for a user to send draft copy material of the printed product to a remotely located printing company, the user tends to choose a printing company whose business areas include where the user is located.

When a manufacturer, as a user, orders a user's manual, for example, to attach the user's manual to its products, the user might have to order a larger number than necessary of the printed products in order to lower a unit cost which is due to the rate system of the conventional off-set printing industry. Furthermore, the user might need storage space to store the inventories created by the aforesaid unnecessary purchase. It causes an increase in inconvenience and unnecessary cost for storage space, for example. Furthermore, if revisions need to be made to the user's manual, the aforesaid inventories will be totally wasted, and as a result, the user might suffer from financial loss. While users of the current conventional printing system typically suffer from inconvenience and unnecessary expenses, printing companies also suffer from inconvenience and unnecessary expenses. For the reasons stated above, printing companies also are forced to do business within a small area. As a result, there is a demand for a system which enables printing companies to operate in a larger area. Also, with the current conventional printing system, it is necessary to keep print plates and print blocks, in a storage room, for the future use for additional copies. As a result, printing companies also need to spend money for keeping a storage room.

[0004]

This invention is made to solve above-described problems. The purpose of this invention

is to provide an on-demand printing device and method and an on-demand printing service system to help lower costs and shorten the printing process time, from preparation of a draft copy to delivery of printed products by storing printing information provided by a user via a computer network as digital data and outputting the data, after properly editing the printing information, to an output device capable of recording the printing information (in a digital data) on a printing medium desired by the user.

[0005]

Means to solve problems

The on-demand printing supporting system of the present invention for outputting printing information to an output device capable of printing the printing information on a printing medium desired by a user, comprises: a printing information recording means for enabling the user to input, via a computer network, the printing information in a predetermined data form, and to record the printing information in a printing information database (S7 through S9 by contents server 12 of the present invention, for example); a printing information retrieving means for notifying a handler that the printing information has been received, and for enabling the handler to retrieve the printing information (S10 through S13 by contents server 12 of the present invention, for example); an edited printing information recording means for enabling the handler to input and record an edited printing information in an edited printing information database (S14 and S15 by file control server 14 of the present invention, for example); and an output means for outputting the edited printing information to a printing device capable of printing the edited printing information on the printing medium

desired by the user (S17 and S18 by output control server 17 of the present invention, for example).

The on-demand printing support system of the present invention, as described above, enables printing companies to receive orders from remotely located users, and to promptly complete printing process and to deliver the printed products to the users.

[0006]

The on-demand printing supporting system of the present invention comprises a request for a cost estimate notifying means for notifying the handler that a request for a cost estimate has been made by the user (S2 through S3 of contents server 12 of the present invention, for example), and a final cost estimate notifying means for enabling the handler to input and send a final cost estimate to the user (S4 through S6 of contents server 12 of the present invention, for example). The printing information recording means of the present invention enables the user who received the final cost estimate to input said printing information, and records the printing information in the printing information database.

[0007]

The on-demand printing supporting system of the present invention comprises a final cost estimate notifying means for notifying the user of the final cost estimate and the ID code which enables the user to connect the user's terminal to said printing information recording means.

Accordingly, the unauthorized access to the on-demand printing supporting system can be

prevented.

[0008]

The on-demand printing supporting system of the present invention comprises a controlled printing information recording means for enabling the handler to input and record in a controlled printing information database a controlled information of the edited printing information. The controlled printing information recording means of the present invention controls the edited printing information recorded in the edited printing information database by the edited printing information recording means.

Accordingly, additional copies based on the previous copy can be swiftly and efficiently made by using the controlled printing information.

[0009]

The on-demand printing supporting system of the present invention includes the output means which comprises a selecting means for selecting an output device from among a plural number of output devices connected to the computer network, and for outputting the edited printing information to the selected output device. Accordingly, printing information inputted by a user can be outputted to a device which is located convenient for the user.

[0010]

In the on-demand printing supporting system of the present invention for outputting printing

information to an output device capable of printing the printing information on a printing medium desired by a user, and for delivering the printed products to the user, the printing information is recorded on the printing medium desired by the user by enabling the user to input to the output device the printing information via the on-demand printing supporting system.

[0011]

In the on-demand printing supporting system of the present invention for outputting printing information to an output device capable of printing the printing information on a printing medium desired by a user, and for delivering the printed products to the user, the printing information is recorded on the printing medium desired by the user by enabling the user to select an output device capable of recording the printing information on the printing medium desired by the user via the on-demand printing supporting system.

[0012]

The on-demand printing supporting system of the present invention for outputting a printing information inputted by a user to an output device capable of recording the printing information on a printing medium desired by the user, comprises the steps of: enabling the user to input the printing information and recording the printing information in a printing information database; notifying a handler that the printing information has been received and enabling the handler to retrieve the printing information; enabling the handler to input an edited printing information and to record the edited printing information in an edited printing information database; and outputting the edited

printing information to the output device capable of recording the edited printing information on the printing medium desired by the user.

[0013]

Various applications of the present invention

1) First Example

A first example of the application of the present invention is explained with drawings, as follows.

Fig. 1 is a block diagram illustrating a constitution of the first example. In Fig. 1, numeral 1 shows an on-demand printing supporting device of the present invention. Numeral 2 is a user who obtains, via on-demand printing supporting device 1, a printed product which the printing information is recorded on the user's desired printing material. Numeral 3 illustrates a computer network, represented by Internet, which connects on-demand printing device 1 to user terminal 2. Numeral 4 illustrates a handler who revises and/or changes a draft copy of the printed product provided by the user 2. Handler 4 includes his operation terminals which can be connected to on-demand printing supporting device 1. Numeral 5 illustrates an output device which stores printing information provided by the user via on-demand printing supporting device 1, and records the printing information on a printing medium desired by the user. More specifically, output device 5 includes toner-type digital printer 51, CD-ROM printing machine 52, ink-jet type printer 53, a magneto-optical disk read/write machine 54, and so forth.

It is noted that the device included in the output device 5 can be either one of toner-type

digital printer 51, CD-ROM printing machine 52, ink-jet type printer 53 or magneto-optical disk read/write machine 54. Also, There can be more than one user 2 in computer network 3.

[0014]

The on-demand printing supporting device 1 consists of homepage provider 1a for providing homepage (contents information provided by the World Wide Web (WWW) server) and file management device 1b for controlling the printing information provided by the user. Further, homepage provider 1a consists of homepage contents 11, contents server 12 and printing information database 13, while file management device 1b consists of file management server 14, finalized printing information database 15, controlled information database 16 and output controller 17.

Homepage contents 11 records homepage information provided by the homepage provider 1 to user 2.

Contents server 12 enables user 2 and/or handler 4 to input information based on the information recorded in homepage contents 11, and sends information to user 2 and/or handler 4. Printing information database 13 records, according to the ID number of user 2, printing information inputted by user 2 from the a user terminal via computer network 3 in accordance with the instructions given by contents server 12.

File management server 14 enables file management device to record the printing information retrieved by handler 14 from printing information database 13 via contents server 12 and edited by handler 4 as a finalized printing information, and controlled information as controlled file. Finalized printing information database 15 records controlled files of finalized printing information inputted

by handler 4. Output controller 17 controls the finalized printing information output to output device 5.

[0015]

Homepage contents 11, printing information database 13, finalized printing information database 15, and controlled information database 16 can be consisted of non-volatile memories, such as hard disk devices, magneto-optical disk devices, flash memory, *etc.*, and volatile memories, such as RAM (Random Access Memory) or, of a computer readable/writable storage medium which is a combination of any of the aforesaid memory devices.

[0016]

The performance of contents server 12, file management server 14 and output controller 17 can be achieved by hardware set solely for its own purpose or, a CPU (central processing unit) in which the memory is loaded with specific programs to achieve the desired performances can be used.

[0017]

An input device, a display device, *etc.* (not shown in figures) are connected as peripheral devices to on-demand printing supporting device. Here, a keyboard, a mouse, *etc.* are used as the input devices. Also, CRT (Cathode Ray Tube) display device, liquid crystal display, *etc.* are used as the display device.

[0018]

The present invention will be explained in conjunction with the accompanying drawings.

Fig. 2 is a sequence diagram illustrating the operation of the present invention. In Fig. 2, content server 12 in the on-demand printing supporting device 1 requests user 2 to make, from the user terminal, a cost estimate request (S1), and the cost estimate request is notified to the on-demand printing supporting device 1 when the user makes selection on the menu posted on the homepage which is provided by contents server 12 (Fig. 3).

Contents server 12 displays in the user terminal, an input operation screen (shown in Fig. 4), notifies user 2 of menu selection necessary to make the cost estimate (S2), and requests user 2 to actually make the selection in accordance with the displayed instructions (S3). Fig. 4 shows the selections for printing information in a certain format. This information represents the printed products which the printing information outputted from output device 5 is recorded on the printing medium. The selection is made by inputting the various information such as paper size, number of pages, binding form of the printing after binding output as storage medium (binding by stapler, by binder, or by wrapper), with cover or without cover, paper material (printing by color sheet of fine quality (super-thick type), color sheet of fine quality (Resak)), number of copies, name and e-mail address for notifying the cost estimate. All these information is sent to the on-demand printing supporting device 1 by clicking "submit button".

When all the selection is made, contents server 14 notifies handler 4 that the cost estimate request has been inputted (S4). Handler 4 is notified, via e-mail, of receipt of the cost estimate request, and the handler makes cost estimate (S5). The cost estimate made by the handler then is

sent to user 2 from the handler terminal via contents server 12 in a form of e-mail as shown in Fig. 6 (S6). The e-mail containing the cost estimate made by the handler also contains a customer ID and a customer password which are necessary for user 2 to access to the printing information input processing of content server 12.

[0019]

Upon receipt of the estimate cost, client ID and client password, the user 2 requests submission of printing information (log into printing service) by selecting “2. Data Submission” menu on the homepage provided by contents server 12 (S7), as shown in Fig. 3.

Contents server 12 displays on the user's terminal an operation panel for connecting the user's terminal to the printing information processor of contents server 12, as shown in Fig. 7 (S8). User 2 then inputs into the operation panel the client ID and client password previously received. The user's terminal then is connected to the printing information processor by depressing the “log-in” button (S9). Contents server 12 then displays on the user's terminal an input screen for inputting the printing information (S10) as shown in Fig. 8. User 2 then selects an appropriate printing information displayed by a certain data format in the user's terminal by depressing the “reference button” on the screen. The printing information is then inputted to contents server 12 by depressing “upload” button on the screen (S11). Here, PDF (Portable Document Format) with which same image on the user's terminal can be obtained on the printing material, or the markup language, html (Hyper Text Markup Language), are preferable as a data format for printing information.

[0020]

Contents server 12 records the printing information, together with the user's client ID, in the printing information database 13, and then notifies the handler 4 that the printing information has been received (S12). Receipt of printing information can be found by handler 4 either by periodically accessing contents server 12 by handler 14, or by notifying handler 4 by contents server 12 upon receipt of printing information. Handler 4 then retrieves the printing information from the printing information database 13 via contents service 12 (S13).

Fig. 10 illustrates one example of the operation in which handler 4 retrieves the printing information via contents service 12. Fig. 10 also illustrates “Download” button for retrieving the printing information, “Delete” button for deleting the printing information from the printing information database, as well as a list of uploaded printing information. In Fig. 10, “From” stands for an address where the printing information has been received from (to contents server 12), “To” stands for an address where the printing information has sent to (from contents server 12), “Real Name” stands for the type of the printing information sent or received, and “Upload Time” stands for a time period for uploading printing information. Handler 4 then downloads the printing information necessary in accordance with the instructions set forth on the operation panel.

For example, in Fig. 9, “try-extaro” has sent printing information, “a” in a HTML format; column “From” shows “try-extaro”, column “Real Name” shows “a.htm”. Handler 4 retrieves the printing information and then edits the received printing information (S14). The edited printing information is inputted to file management server 14 by handler 4, and then sent to and stored in finalized printing information database 15 (S15). If no editing job is necessary, the printing

information received by handler 4 can be sent to finalized printing information database 15 from printing information database 13 as a finalized printing information.

[0021]

File management server 14 receives from handler 4 controlled printing information as a control file for controlling edited printing information, and records that information in controlled information database 16 (S16). Fig. 11 illustrates contents of a control file created by handler 4. Fig. 11 shows record contents in the control file made by handler 4. This is also a control file in the case where a recording medium output from output device 5 is a bound print, and in the control file, name of the sales person, information on the customer (category and name), date when complete manuscript information was made, name and parts/reference number of the complete manuscript file, the language used in complete manuscript information, number of pages, price per page, size of the print copy, quality of a cover, paper quality of the text, print information on the cover, text print information, print color of the cover, binding style, binding method, name of support staff 4, data form of the manuscript (kind of the manuscript), control number of the recording medium (*e.g.* an optical magnetic disk such as MO *etc.* and a tape) which records complete manuscript information in electronic data format, *etc.*

After file management server 14 has recorded complete printing information in finalized printing information database 15, and has recorded control file in controlled information database 16, handler gives instructions (S17) to output controller 17 to output finalized edited printing information to output device 5. (S18). At this point, when output device 5 includes a plurality of

devices, (e.g. toner digital printer 51, CD-ROM printing device 52, ink-jet printer 53, magneto-optical disk read/write device 54, *etc.*) handler 4 selects an appropriate output device.

Then, output device 5 records the printing information on a recording medium desired by the user (for example, a printed and bounded product or a CD-ROM) (S19). The final printed products will be delivered to user 2 via delivery means such as mail, private home delivery services, *etc.* (S20).

[0022]

2) Second Example

Referring to Fig. 12, the elements illustrated in Fig. 12 bearing the same reference numeral numbers as the elements illustrated in Fig. 1, perform the same functions as the elements illustrated in Fig. 1 bearing the same reference numeral numbers found in Fig. 12. As to the reference numeral numbers not found in Fig. 1, that is, 2-1 ~ 2-n, this represents a plural number of users and 5-1 ~ 5-n represents a plural number of output devices which are connected to computer network 3, with which the printing information provided by the users are recorded, via the on-demand printing support system, on the printing medium desired by the users. As explained in the example 1 above, output devices 5-1 through 5-n can be toner-type digital printer 51 which electronically gather pages in order, CD-ROM printing machine 52, ink-jet type printer 53, magneto-optical disk read/write machine 54, *etc.* Devices to be included in output device 5 may be one of the followings: toner-type digital printer 51 which electronically gathers pages in order, CD-ROM printing machine 52, ink-jet type printer 53, magneto-optical disk read/write machine 54, *etc.*

As shown in Fig. 12, "1 through n" shown next to numeral numbers 2 corresponds to the same number "1 through n" which appears next to 5. For example, output device 5-1 is used for recording the printing information on a desired printing medium desired by user 2-1, output device 5-2 is used for recording the printing information on a desired printing medium desired by user 2-2, and output device 5-n is used for recording the printing information on a desired printing medium desired by user 2-n. As output devices are located nearby their users for their convenience, if user 2-1 is located in the Hokkaido region in Japan, output device 5-1 is also located in the Hokkaido region in Japan. Similarly, if user 2-2 is located in the Kyushu region in Japan, output device 2-2 is also located in the Kyushu region in Japan.

[0023]

Referring now to Fig. 13. Fig. 13 is a sequence diagram for example 2. In Fig. 13, the elements illustrated in Fig. 13 bearing the same step numbers as the elements illustrated in Fig. 2, perform the same functions as the step numbers illustrated in Fig. 1. With respect to the step numbers which are not shown in Fig. 2, When file management server 14 records in finalized printing information database the edited printing information, and in controlled information database the controlled file, output controller 17 requests handler 4 to select an output device (S21). Handler 4 then selects an output device which is located nearest the user. For example, if the printing information is provided by user 2-1, then handler 4 selects output device 5-1, and if the printing information is provided by user 2-2, handler 4 selects output device 5-2. Upon selection of an output device, output controller 17 outputs, in accordance with the instructions provided by handler 4 (S17),

edited printing information to the selected output device (S22). The selected output device records the printing information on the recording medium desired by the user (bounded printed material or CD-ROM) (S19), and the finished products are shipped to the user 2 by mail or other delivery means (S20).

[0024]

As mentioned above, the printing information inputted by the user is recorded, via the on-demand printing supporting system, on the printing medium. It is noted that the owner of the on-demand printing supporting system may record the printing information which the owner holds the copyright, on a printing medium via the on-demand printing supporting system, and deliver the printed products to its client.

[0025]

It is further noted that a computer system may be used to function as the on-demand printing supporting system described above, by recording the programs necessary to function the on-demand printing supporting system in the computer readable recording medium so as to store the recorded programs in the computer system.

[0026]

The aforesaid computer system includes hardware, such as OS or peripheral devices. When the WWW (World Wide Web) system is used, homepage providing environment (or, display

environment) is also included. Also, the aforesaid computer readable recording medium is memory devices stored in a computer system, such as floppy disks, magneto-optical disks, ROMs, CD-ROMs, or storage devices. Further, the aforesaid computer readable recording medium includes transmission media or transmission wave, for example, which keeps the programs actively for a short time as transmitting the programs via computer networks, such as Internet, and communication lines, such as telephone lines. Also, volatile memory installed inside a computer system which is to be a server or a client, for example, may be included in the aforesaid computer readable recording medium, which keeps the programs for a certain time,

[0027]

It is further noted that the above-described programs may be enable part of the on-demand printing supporting system described above. Also, the programs may a so-called "differential program" which can be combined with programs which have already been stored in the computer system so as to function as a complete on-demand printing supporting system.

[0028]

Improvement made by the present invention

As described above, according to the present invention, there is no need to produce print plates and/or print blocks for printed products, nor is there need to prepare draft copy material of a printed product by both a printing company and a user and therefore, eliminating unnecessary precesses, preventing time loss financial loss during the printing process as well as poor printing

quality. Also, users can avoid time loss shipping expenses generated by shipment of the printing copy material. Further, users can avoid expenses for storage which are necessitated by unnecessary copies ordered to in order to lower a unit cost which is due to the rate system of the conventional off-set printing industry. In addition, the further financial loss can be avoided when revisions becomes necessary for printed products because there are no unnecessary copies stored in a storage room to be wasted.

Similarly, printing companies can expand their business areas and will be able to avoid expenses generated from storage spaces for print plates and/or print blocks, as well as from printing excessive printed copies.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram illustrating constitution of the first example.

Fig. 2 illustrates a sequence of the operation of the first example.

Fig. 3 illustrates the cost estimate operation of the first example wherein a user requests cost estimate.

Fig. 4 illustrates the cost estimate operation of the first example wherein the user inputs detailed information of the cost estimate.

Fig. 5 illustrates the cost estimate operation of the first example wherein a handler is notified that the cost estimate has been requested.

Fig. 6 illustrates the cost estimate operation of the first example wherein the user is notified of the cost estimate result.

Fig. 7 illustrates an operation panel of the first example wherein the user connects a user's terminal to a printing information input processor.

Fig. 8 illustrates the operation panel of the first example wherein the user inputs the printing information.

Fig. 9 illustrates the operation panel of the first example wherein the user confirms the printing information inputted by the user.

Fig. 10 illustrates the operation panel of the first example wherein the handler receives the printing information provided by the user.

Fig. 11 illustrates an example of a controlled file, of the first example, created by the handler so as to record edited printing information.

Fig. 12 is a block diagram illustrates constitution of the second example.

Fig. 13 illustrates a sequence of the operation of the second example.

REFERENCE NUMERAL NUMBERS

1: on-demand printing supporting system

2: user

2-1 through 2-n: user

3: computer network

4: handler

5: output device

5-1 through 5-n: output device

51: toner-type digital printer

52: CD-ROM printing machine

53: ink-jet type printer

54: magneto-optical disk read/write printing machine

11: homepage contents

12: contents server

13: printing information database

14: file management server

15: finalized printing information database

16: controlled information database

17: output controller

S1 through S3: a request for a cost estimate notifying means

S4 through S5: a final cost estimate notifying means

S7 through S9: a printing information recording means

S10 through S13: a printing information retrieving means

S15: an edited printing information recording means

S16: a controlled printing information recording means

S17 through S18: output means

S21 through S22: selecting means